

*Occultations of Stars by the Eclipsed Moon, 1892 May 11, and other Phenomena, observed by the Rev. A. Freeman, M.A.*

The stars are those of the list published in the *Observatory* of 1892 May. The telescope employed was my 6½-inch refractor, with an eyepiece having a power of 35 and a field of 1° 8' in diameter. The time is dependent on comparisons of a solar chronometer with a trustworthy electric time-signal, May 4 and May 12, showing a daily gaining rate of only 0<sup>s</sup>.14 in the interval.

B.D. -19°.	Magn.	Occ.	G.M.T.	Remarks.
			h m s	
4091	8.3	D.	10 17 25.25	Sudden.
4095	8.9	D.	10 35 51.25	Sudden.
4087	9.7	R.	11 3 4.25	Late.*
4099	8.2	D.	11 14 18.25	Final.†
4091	8.3	R.	11 35 2.25	Sudden.
4095	8.9	R.	11 44 14.25	Late.‡
4097	9.4	R.	11 48 9.25	Late.*

*Phenomena of the Shadow.*

h m	
9 11.4	Moon has entered shadow (late).
9 17.4	Shadow bisects Aristarchus.
9 31.4	Shadow touches Copernicus ring on E.
9 32.9	Shadow touches Mersenius on E.
9 34.0	Shadow covers Mersenius.
9 34.8	Shadow touches Copernicus ring on W.
10 9.2	Shadow touches Tycho ellipse on E.
10 11.1	Shadow bisects Tycho.
10 12.5	Shadow touches Tycho ellipse on W.
11 20.9	Shadow touches Tycho on S.
11 22.4	Shadow bisects Tycho.
11 24.0	Shadow touches Tycho on N.
12 37.5	Moon has left shadow (late).

There was a certain amount of haze about throughout the eclipse, varying in density but without cloud. The haze became

\* Star first seen 22''·3 off limb of  $\gamma$  (= half greater axis of Tycho).

† This double star hung on the limb for two or three seconds.

‡ Star first seen 8''·2 off limb of  $\gamma$  (= quarter least axis of Tycho).

so dense at the end of the eclipse as to entirely conceal the reappearance of 4099, which was unfortunate. At the time of the greatest eclipse I estimated that only one-twentieth of the diameter of the Moon was uncovered, giving a magnitude of eclipse 0.950, closely agreeing with the *Nautical Almanac* 0.953. The eclipsed Moon at greatest obscuration appeared to have a bluish-grey tinge near the border of the shadow, and this tint gradually changed and finally became of a warm orange-grey tinge at the region furthest from the uneclipsed part of the Moon. There was a singular appearance within the shadow of bright curved wedge-like parts, with their bases on the east and west ends of the shadow's boundary, and with their points on the Moon's limits quite  $40^\circ$  from the illuminated part. The eastern wedge was the brighter of the two, but their magnitudes were the same. The existence of these wedges was manifest to the unaided eye, and to it the colour of the shadow at greatest obscuration was dark copper, it having been a few minutes previously bright copper. Two or three lunar peaks were visible near the S.W. point of Moon's limb, the loftiest projection a little S. of S.W.; there was a solitary, rather smaller, projecting peak near the S.E. point of the Moon's limb. During the progress of the eclipse the penumbra gave a pale straw colour to the lunar surface covered by it. The position of the observatory is  $3^m 0^s$  E., and  $51^\circ 20'$  N. approximately.

*Murston Rectory, Sittingbourne:*  
1892 May 23.

*Occultation of 73 Piscium by Jupiter, 1892 May 23, observed at  
the Royal Observatory, Greenwich.*

*(Communicated by the Astronomer-Royal.)*

Notice was called to this phenomenon by Mr. Marth in the April number of the *Monthly Notices*, and as the morning was fine, an attempt was made to observe it with the 10-inch guiding telescope of the photographic equatorial. Owing to the low altitude of *Jupiter*, its limb was boiling violently, and accurate observation was only possible at occasional brief intervals of good definition.

The following notes describe what was seen at these moments:—

Phenomenon Observed.	Observer.	Sidereal Time.	Mean Time.
Disappearance.		h m s	d h m s
Star almost in contact with limb	A. C.	19 25 49	23 15 17 4
Star apparently bisected	„	19 27 20	18 35
No trace seen of star	„	19 32 44	23 58
Reappearance.			
Star suspected for a moment	„	19 41 11	32 24
Star certainly reappeared	„	19 46 7	37 19